Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

SHOUT
SHARE
IT

U. S. DEPARTMENT OF AGRICULTURE.

REPORT

OF THE

CHIEF OF THE BUREAU OF BIOLOGICAL SURVEY

FOR

1911.

LIBRARY
RECEIVED
DEC 9 1911
Department of Agriculture

BY

HENRY W. HENSHAW.

[From Annual Reports of the Department of Agriculture.]

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1911.

CONTENTS.

	Page.
Work of the Biological Survey	3
Increasing the number of native birds	3
Woodpeckers	4
Birds of Arkansas	5
Food of wild waterfowl	5
Epidemic among wild ducks at Great Salt Lake	6
Alfalfa weevil	6
Ground squirrels	6
Rodents in relation to reforestation	7
Prairie dogs	7
Moles	7
Fur-bearing animals	8
Cooperative work in relation to spotted fever	8
Crawfish in relation to agriculture	9
Biological investigations	9
Importations	11
Game protection	12
Bird reservations	12
National bison range	15
Alaska	15
Elk in Wyoming	15
Information concerning game	16
Cooperative work in game protection	16
Plumage	17
Interstate commerce in game	17
Outline of work for 1912	18
Economic ornithology and mammalogy	18
Geographic distribution	18
Game protection	19

REPORT OF THE CHIEF OF THE BUREAU OF BIOLOGICAL SURVEY.

U. S. Department of Agriculture,
Bureau of Biological Survey,
Washington, D. C., October 17, 1911.

Sir: I have the honor to submit herewith a report on the work of the Biological Survey for the fiscal year ending June 30, 1911, with an outline of the work for 1912.

Respectfully,

Henry W. Henshaw,
Chief, Biological Survey.

Hon. James Wilson,
Secretary of Agriculture.

WORK OF THE BIOLOGICAL SURVEY.

INCREASING THE NUMBER OF NATIVE BIRDS.

During the year circulars have been issued calling attention to the fact that certain of our native birds appear to be diminishing in numbers. This applies particularly to game birds, but it is true also of some of the more valuable insectivorous species and of shore-birds. Moreover, it is doubtful if, taking the country as a whole, any of our native species are increasing, except perhaps in restricted localities. This is the more deplorable, inasmuch as now, more than ever, there is pressing need of the services of insectivorous birds to hold in check the constantly increasing numbers of insects imported from abroad or that cross our borders from adjacent territory. As these destructive foreign insects are rarely accompanied by the enemies which check their increase in their native habitat, they soon multiply till they become veritable pests. Nature has provided in this country a sufficient number of species for the work of keeping insects in check, including the various swallows, fly-catchers, thrushes, woodpeckers, sparrows, and others, and it remains for us by vigorous and concerted effort not only to protect the useful species, but to enable them to so increase that their warfare against the insect hosts shall be thoroughly effective. This can best be effected in four ways:

(1) By providing artificial nesting sites for the species that nest in hollow trees or in the cornices and cavities of buildings. To some slight extent this is already being done in this country, but to obtain appreciable results provision must be made on a much larger scale. It is well within the capabilities of the average farmer boy, when furnished with a few necessary tools, to make nesting boxes for some

of our most valuable species, as bluebirds, swallows, wrens, and woodpeckers. When put up near the farmhouse these not only serve to attract birds and provide for their increase, but add much to the interest and pleasure of the household. The making of artificial nesting boxes has become an established industry in Germany, where the need of increased numbers of insectivorous birds for the protection of the forests was clearly perceived, and they are beginning to be put on the market in this country.

(2) By planting thickets of berry-bearing trees and shrubs along the roads or in waste places on the farm, which will provide not only food but also nesting places and refuge resorts from nocturnal enemies of the birds. On many farms it is necessary only to preserve and encourage clumps of native trees and shrubs already grown and thrifty, but where such do not exist the little time and outlay required for setting out and caring for these bird reserves will be richly repaid by the results.

(3) By carefully protecting the birds already occupying the premises. Present sentiment for the preservation of insectivorous birds is already strong in most parts of this country, and the chief need of protective laws is to insure the safety of our birds from foreign immigrants who, having been accustomed at home to kill for food any and all kinds of birds, large and small, young and old, naturally assume the same privileges in their adopted home. In some parts of the country, moreover, such birds as robins, bluebirds, nighthawks, killdeers, flickers, and other valuable species are slaughtered for food in vast numbers by our own citizens, either ignorant or careless of the fact that the country can ill afford to lose the services of these insectivorous species. The quail and prairie chicken are favorite and legitimate objects of pursuit by sportsmen, but they have been so ruthlessly pursued that they are now generally scarce and in many localities practically extinct. As the bobwhite is a most efficient weed destroyer, to say nothing of its being an active insect hunter, the farmer is called on to decide whether this bird is not too valuable on his farm to be shot for food or sport.

(4) By supplying water for birds. Though at first thought it may seem a small matter, a supply of water for drinking and bathing purposes is of great importance to birds. Running water is, of course, preferable, but shallow vessels distributed over the premises at short intervals in which a supply of water can be constantly renewed will be found to attract great numbers of birds and induce them to make their homes there.

WOODPECKERS.

From an economic standpoint our native woodpeckers may be divided into two classes. The first comprises the bulk of the family and includes upward of 50 species. All of these render extremely valuable service to the farmer, the horticulturist, and the forester. Specially equipped by Nature for digging into wood, they supplement the service of other species and destroy vast numbers of insects inaccessible to other birds.

The second class comprises four species whose range collectively extends across the United States from ocean to ocean. These are

properly known as sapsuckers, for the reason that they excavate holes in the bark of trees for the purpose of obtaining their favorite food, which is the inner bark and the sap that exudes from the wounds. The injury thus inflicted on old trees is usually not so great as to affect their vitality seriously, but sapsuckers often cause the death of young trees. Moreover, after many years the timber from trees attacked by them reveals stains and defects which often materially lessen the value of the finished product. It is estimated that the damage to timber caused by these birds in the United States amounts to more than a million dollars annually. During the year bulletins were issued on both groups of woodpeckers, based on stomach examinations of many individuals and on extended field observations. The main purpose of these publications is to acquaint farmers and others with the part the several kinds of woodpeckers play, so as to enable them to distinguish friends from foes. Methods of protecting trees attacked by sapsuckers are given.

BIRDS OF ARKANSAS.

During the year an assistant of the bureau studied the birds of Arkansas and made careful observations of their habits. With the data thus obtained as a basis, a list of the birds of the State has been issued, no adequate list having previously been printed. In this list are recorded all the data resulting from the field work of the survey and all the information that could be gathered from other sources, with notes on the habits of the birds, especially in regard to their economic relations. We thus have for the first time an excellent idea of the avifauna of this important agricultural State.

FOOD OF WILD WATERFOWL.

The marked decrease in the number of our wild fowl in the last decade has attracted attention in every part of the country and caused much concern not only to sportsmen but to State authorities interested in the conservation of our natural resources. It is evident that increasingly stringent laws shortening the open season, prohibiting spring shooting, and decreasing the bag limit will materially aid in the preservation of the fast diminishing numbers of our waterfowl. The above measures may well be accompanied by action of the several States in setting apart suitable lakes and ponds for bird refuges where migrating waterfowl may safely resort and when so inclined may breed. Another important measure is the planting in suitable waters of native plants adapted to the varying taste of the more important kinds of ducks and geese. During the year investigations of the food of ducks and geese were continued, and field work in connection with these important investigations was done in Arkansas, Tennessee, Texas, Louisiana, and Florida. Many of the important winter feeding grounds of ducks and geese in these States were visited, and the feeding habits of the various species were carefully studied. A preliminary circular on the food of waterfowl was issued with a view of awakening interest in the subject and of supplying practical information in response to the many letters of inquiry from various parts of the United States.

EPIDEMIC AMONG WILD DUCKS AT GREAT SALT LAKE.

Following a long dry season, which favored the rearing of a large number of wild ducks, but materially reduced the area of the feeding ponds, resulting in great overcrowding, a severe epidemic broke out about August 1, 1910, among the wild ducks about Great Salt Lake, Utah. Dead ducks could be counted by thousands along the shores and the disease raged unabated until late fall. Shooting clubs found it necessary to declare a closed season. Some of the dead ducks were forwarded to the Biological Survey and were turned over for examination to the Bureau of Animal Industry, by the experts of which the disease was diagnosed as intestinal coccidiosis.

Various plans of relieving the situation were tried: The irrigation ditches were closed, thus providing the sloughs and ponds with fresh water, and lime was sprinkled on the mud flats and duck trails. Great improvement followed this treatment, and experiments proved that ducks provided with abundant fresh water and clean food began to recover immediately. These methods promised success, but later it was proposed that the marshes be drained and exposed to the sun's rays—a course which can not be recommended. That coccidia are not always killed by exposure to the sun is shown by their survival on the sites of old chicken yards. An added disadvantage of the plan is that draining and drying the marshes would have a bad effect on the natural duck foods and upon the birds themselves.

ALFALFA WEEVIL.

The recently imported alfalfa weevil threatens to add a very injurious insect pest to the many existing in the United States. Already seriously destructive in Utah, should the insect continue to spread it is likely to endanger the alfalfa industry throughout the Western States. The Biological Survey is cooperating with the Bureau of Entomology in investigations to devise means of checking the spread of the weevil. Preliminary work has already shown that a number of birds feed on the insect, and it is hoped to spread this information among the farmers and so secure their aid in furthering measures for the protection and increase in numbers of these particular species.

GROUND SQUIRRELS.

During the year field investigations and experiments were continued to discover better methods of destroying ground squirrels in the National Forests and elsewhere. In order to test the efficacy and cheapness of the strychnine-starch solution recommended in Circular No. 36, several demonstrations on a rather extensive scale were undertaken in California. The Kern County Land Co., of California, under the supervision of the Biological Survey, successfully treated 29,000 acres of alfalfa with poisoned grain for the purpose of exterminating ground squirrels over the area. At the Jesus Maria Rancho an assistant of the Biological Survey supervised the destruction of ground squirrels over about 25 square miles of range lands and practically exterminated them at a cost of about 4 cents an acre. In winter, experiments were carried on in the San Joaquin

Valley for the purpose of finding a bait for use in the winter or wet season as effective as the strychnine-barley bait in the dry season—so far, however, without success.

RODENTS IN RELATION TO REFORESTATION.

Cooperative work with the Forest Service was continued during the year to devise methods of preventing the destruction of seeds in reforesting enterprises in the National Forests. Experiments were conducted in the Black Hills Forest of South Dakota, the Pike Forest of Colorado, the Pecos Forest of New Mexico, and the Coconino Forest of Arizona. The only practicable means to insure the safety of newly grown or planted seed was found to be the destruction of the small rodents infesting the tract. This is best done by means of poisoned bait prior to the seeding. Whether the same methods and same bait will prove as efficacious elsewhere as in the Rocky Mountain regions remains to be determined, but it is believed that by the methods set forth in Circular No. 78, "Seed Eating Mammals in Relation to Forestry," the loss during reforesting operations in the Rocky Mountain region can be reduced to a minimum.

PRAIRIE DOGS.

Prairie dogs still continue to be a pest in certain States, and in regions where new land is being brought under cultivation sometimes render successful crop raising by farmers of small means impossible. They also indirectly cause great loss to stockmen by eating forage plants and thus limiting the number of cattle that can be carried on a given range. In cooperation with the Forest Service it is hoped eventually to exterminate these pests within the National Forests. Until, however, the several States take concerted action looking to the destruction of all prairie dogs within their boundaries, there can be no permanent diminution of these pests and no final abatement of the damage they cause. The preparation and sale to the farmers by the State experiment stations, or other authorized agencies, of poisoned bait at cost would greatly stimulate the work of ridding agricultural and pasture lands of the rodents. During the year demonstration work was carried on in Montana, Wyoming, California, New Mexico, Arizona, and Kansas with the starch-barley preparation, which appeared to be exceedingly effective with these animals even where there is green forage. Notwithstanding the fact that the animals are partial to oats, in some cases barley has been found to be a more effective vehicle for poison, as the hull which carries the poison can not be so easily removed.

MOLES.

That moles do much damage to lawns has long been known, and in addition farmers often charge them with the destruction of potatoes and other crops; but until recently the mole has not usually been classed among noxious animals, since it has been assumed that its food consists almost exclusively of insects and earthworms. Recent investigations show, however, that while the animal does much good

by destroying insects it also attacks crops to some extent, especially seed corn, although much of the damage attributed to this rodent is due to field mice, which habitually use the runways of the moles. Efforts are being made to secure the stomachs of moles from different agricultural sections of the country with the view of increasing our knowledge of the food habits of this little mammal, and a bulletin will be issued defining its economic status and explaining methods of destroying it when necessary by traps and poisons.

FUR-BEARING ANIMALS.

The present high price of furs is due less to passing fashion than to the actual and growing scarcity of fur-bearing animals. As wearing apparel and for personal adornment furs occupy a place of their own, and there seems to be no acceptable substitute for them. For years the demand for furs has been greater than the supply, and, chiefly as a result of the encroachments of civilization on the breeding range of the animals and the unceasing activity of trappers, the number of fur bearers has been greatly reduced. If in the future furs are to be worn by any but the rich, it would seem that recourse must be had to fur farming on a large scale. The fur bearers best adapted for artificial breeding appear to be foxes, minks, and martens. Attempts to raise these animals, especially the first two named, are being made by private parties in various parts of this country and Canada. So far none of these enterprises appear to have passed the experimental stage, although a number of breeders of the silver fox claim to have made the business remunerative. It is believed that under suitable climatic conditions and with a fair understanding of the nature and methods of the business, the rearing of foxes and minks, and perhaps also martens, can be made a permanent and profitable occupation. The experiments now under way are being watched with great care, and all possible information is being obtained from breeders as to the treatment and feeding of the animals, with a view of ultimately issuing bulletins on the subject to supplement the two already published on fox farming and the muskrat industry.

COOPERATIVE WORK IN RELATION TO SPOTTED FEVER.

In cooperation with the Bureau of Entomology and the State experiment station of Montana much work was done by the Biological Survey during the year in Bitterroot Valley, Mont., to determine which of our native mammals act as hosts of the fever tick and thus aid in spreading spotted fever. In one or another stage of development fever ticks were found on no fewer than 18 of the wild mammals of the district. Some of these, like the larger game animals, are so scarce and inhabit places so remote from the habitations of men that they probably have little to do with the spread of the disease. Others, however, particularly ground squirrels, woodchucks, pine squirrels, and chipmunks, are very numerous in both cultivated and waste places contiguous to farms and villages, and any plan for permanently freeing the valley from fever ticks necessarily involves the extermination or the material reduction in numbers of these mammals. Thorough investigations are now being made by one of

the assistants of the survey with the view to discover effective methods of ridding large tracts of the above and other tick-carrying animals. A prime requisite of such methods is cheapness, since, while in its most virulent form the spotted fever is confined to a comparatively small area on one side of the Bitterroot Valley, the disease in milder form is distributed over thousands of square miles in the Rocky Mountain region, including parts of several States.

To disseminate the information thus far obtained and to aid in the study of the disease, a circular has been published and distributed giving a list of the wild mammals living in and around the valley and indicating the species which are known to act as hosts of the tick.

CRAWFISH IN RELATION TO AGRICULTURE.

In certain sections of the South crawfish exist in very great numbers, especially in Mississippi and Alabama, where there is a single tract of more than 1,000 square miles where the raising of cotton and corn is rendered difficult and in places unprofitable by these crustaceans, which devour the young and tender plants. Some idea of the numbers of crawfish may be gained from the statement that in badly infested areas there are from 10,000 to 12,000 holes to the acre, each hole being made by a single crustacean. Investigations and experiments made on the ground show that at a comparatively small expense it is possible to practically free a given tract from the pests by the use of carbon bisulphid, two or three drops to a hole, and by employing men to kill the crawfish when they emerge on rainy mornings or evenings to feed. A circular on the subject describing the habits of the animals, so far as they concern the planter, and suggesting methods of killing them by means of chemicals is in course of preparation, and when published will be freely distributed in the sections where crawfish are troublesome.

BIOLOGICAL INVESTIGATIONS.

Field work during the year was carried on in Alabama, Arkansas, Idaho, Kentucky, Montana, Tennessee, Wyoming, and Virginia.

The final report on the biological survey of Colorado has been published. It includes description of the life and crop zones of the State, with a zone map; also a full list of the mammals, with important contributions to our knowledge of their abundance, distribution, and relations to agriculture.

The biological survey of New Mexico also has been finished, and final reports on the life and crop zones, with a zone map, and full reports on the mammals and birds, are nearly complete.

The biological surveys of previously unworked parts of both Idaho and Montana have been made as part of the general survey of these rapidly developing States. A previously unknown species of ground squirrel was found to be abundant in Idaho. The animal is of considerable economic importance, owing to the damage it does to crops throughout some of the best farming country.

The biological survey of the lower Mississippi Valley region has been continued, and a report on the birds of Arkansas, including notes on distribution areas and a map of the life and crop zones, has

just been issued. This is the first of a series of reports upon this region, which will be issued as rapidly as possible.

In addition to the area just named, work has been done also in Kentucky, Louisiana, and Tennessee. The results obtained will be incorporated as rapidly as possible into final reports on the region. The biological survey of Alabama is under way, and will be pushed to completion as quickly as practicable. The field work of this branch of the biological survey in the lower Mississippi Valley is of special value at the present time, owing to rapid agricultural development and the necessity for studying the habits of the birds and mammals found there, since many of them are of marked economic importance.

Office work, making available the vast amount of information collected during the years of field work of the Survey, has advanced satisfactorily. Great progress has been made in mapping the distribution of both birds and mammals, thus placing these data in shape to be of direct service in the States covered by the various species. These maps are being issued in connection with various publications.

Large additions have been made to the great store of information already accumulated concerning bird migration; also concerning the distribution and habits of birds. Bulletins have already been published on the distribution and migration of warblers, waterfowl, and shore birds. Another bulletin is now in preparation on the distribution and migration of herons and ibises.

A monograph on wood rats of the genus *Neotoma*, a group of widely distributed rodents, which occur from coast to coast in the United States, has been published, giving a description of the species and their distribution. Many species are of more or less economic importance, and one has harbored plague-infected fleas.

A report upon the muskrats has been published, giving descriptions of the known species in North America, with a brief account of their range, habits, and character, and the value of their fur. While individually insignificant, these mammals are collectively among the most valuable fur bearers, and they are worthy of careful protection.

A report on spiny pocket mice (*Heteromys* and *Liomys*) has been issued. These animals occur along our southern border, and, like other pouched rodents, are more or less injurious to crops wherever they occur in cultivated areas.

During the first part of the year a biological reconnoissance was made across the northern part of British Columbia with special reference to the distribution of the species of birds and mammals occurring also within our territory to the north or south. This work was done at small expense to the Survey through the generous cooperation of Mr. George Mixter. A report for publication upon the work is in course of preparation.

An elaborate report on the birds of Texas is well advanced toward completion and should be ready for publication during the coming year.

During the summer of 1910 the Smithsonian Institution undertook the organization of a biological survey of the Canal Zone. This was considered to be of such great and immediate interest that the Presi-

dent approved the plan to have specialists from various bureaus detailed to the work. In cooperation with the Smithsonian Institution the Biological Survey has charge of the investigation of the mammal and bird life of the zone, and has already secured very interesting and valuable results.

Throughout the year large numbers of specimens have been identified for colleges, experiment stations, and individuals. The classification of the data in our files, as well as the preparation of the maps showing the distribution of the birds and mammals, is of great value in connection with the study of the economic relation of the species and as a basis for laws for the protection of useful kinds and the destruction of noxious ones. As the files are being brought more and more nearly up to date, this information becomes increasingly useful.

IMPORTATIONS.

Although the restrictions on importation imposed by the Lacey Act are widely known, efforts to import objectionable birds and mammals continue and require constant watchfulness.

The usual supervision of the importation of birds and other animals required by section 241 of the United States Criminal Code has been maintained. Five hundred and nineteen permits have been issued and 123 of the consignments have been inspected by the regular inspectors of the Biological Survey stationed at New York, Philadelphia, and San Francisco. Under these permits there have been imported 450,946 birds and 4,063 mammals. Of the birds 345,210 were canaries, 13,398 pheasants, 36,507 European partridges, 5,994 miscellaneous game birds, and 49,837 miscellaneous nongame birds. In addition 24,318 birds and 1,364 mammals requiring no permit were admitted to entry, making the total entries during the year 354,858 canaries, 13,398 pheasants, 36,507 European partridges, 6,163 miscellaneous game birds, 64,338 miscellaneous nongame birds, and 5,427 mammals. Thirty-two permits were issued at Honolulu, under which there were entered 63 birds, 7 mammals, and 3 reptiles. Of the pheasants 12,326 were English ringnecks, imported for stocking game covers, and the rest miscellaneous species, including two of the rare Argus pheasants, which are brought in chiefly for aviary purposes. European partridges showed an increase of 93 per cent over last year's importation. The importation of quail from Mexico reached 3,110 as against 1,246 in 1909–10. The Formosan teal was apparently first imported into the United States August 2, 1909, and 178 entered the United States before July 1, 1910, and 146 more during the current year.

Among miscellaneous nongame birds five of the greater birds of Paradise were probably the first living individuals of this species ever brought in, although the skins of these beautiful birds are very popular for millinery. Interesting also is the entry on May 31 of four barbets (*Trachythonus cafer*), apparently the first importation of this striking species. Of the Shâma thrush, one of the most attractive songsters of India, 237 were brought in, as compared with 231 last year, and of the beautiful Lady Gould finches of Australia, 273, as compared with 460 last year. As a result of overstocking the market, importation of the Indian yellowhammer fell from 1,945

in the first half of the calendar year 1910 to 204 during the entire fiscal year just past.

There was a decrease of 23 per cent in the number of mammals imported, as compared with last year. Among those entered especial interest attaches to the importation of 6 musk oxen, brought from the Arctic by Mr. Paul J. Rainey, for the New York Zoological Park.

Late in 1910 information was received of a mongoose and two flying foxes on exhibition at Kansas City. These were placed in zoological parks. Three mongooses brought to New York from Cienfuegos, Cuba, February 23, 1911, were not allowed to land, but were killed on board ship.

Notable progress was made on the card index of importations. Entries of game birds were brought down to date and the importations of game birds during the first 10 years' operation of the law requiring permits from this Department were tabulated.

GAME PROTECTION.

As the settlement of the country progresses, the preservation of its game becomes more and more difficult, not only because of the increasing number of sportsmen, but because of the steady encroachment by settlers upon the breeding places of wild game. It is becoming apparent that even should all the markets be closed and the sale of game prevented, depletion must continue to follow the rapid conversion of the wilderness. The question of preserves for game and for birds—safe and suitable spots where they can multiply in security from the gun and under natural conditions—is therefore becoming increasingly important. In this country it is gratifying to note that game preserves, both public and private, have greatly increased in numbers, while here and there tracts are beginning to be devoted to nongame birds.

BIRD RESERVATIONS.

On April 11 a new bird reservation was set apart by Executive order in northern California, on Clear Lake Reservoir site, a few miles southeast of Klamath Lake, thus increasing the total number of reservations to 52. An additional warden was appointed for the Breton Island Reservation, and changes were made in the wardens located at Malheur Lake, Pine Island, Dry Tortugas, and the three reservations along the Washington coast. An inspector was appointed for the Cold Springs Reservation, in Oregon, and for Deer Flat and Minidoka Reservations, in Idaho, and at the beginning of next year another inspector will be chosen for the Flattery Rocks, Quillayute Needles, and Copalis Rocks Reservations, in Washington.

The prosecution under the immigration laws of the employer of the 23 Japanese poachers arrested on Laysan and Lisiansky Islands in January, 1910, was concluded early in the fiscal year, the court holding that no sufficient case had been made against him. Despite this decision, it is believed that the arrest of the poachers and the seizure of the plumage will suffice to prevent recurrence of similar acts of trespass on islands in the Hawaiian Reservation. In the trespass case on the Mosquito Inlet Reservation the defendants pleaded guilty and paid small fines.

Two cases of trespass required consideration—one on the Deer Flat Reservation, Idaho; the other on the Tortugas Reservation. It has been the policy of the Department to secure the cooperation of residents adjacent to reservations rather than to incur their enmity through rigorous measures, but in the Deer Flat case the violation was so flagrant that prosecution was deemed necessary. In the other trespass case the offenders were fishermen, probably from Habana, who landed on Bird Key, in the Tortugas Reservation, during the winter and stripped the warden's quarters of everything portable, including the lumber and other materials for repairs and improvements. The matter was brought to the attention of the Secretary of the Navy, who directed the commandant of the naval station at Key West to warn fishermen and others not to land on the Tortugas Reservation.

Under the usual permission to trap on Lake Malheur and Klamath Lake Reservations the wardens report the following number of fur-bearing mammals secured during the season: Malheur Lake, 2,456 muskrats and 31 minks: Klamath Lake, 8 skunks, 5 otters, 12 raccoons, 213 minks, and 7 weasels.

Pelican Island Reservation.—The second nesting on Pelican Island extended from the latter part of May, 1910, to the end of August. When able to fly the young birds left, but in September some returned, and by the middle of the month there were from 2,000 to 3,000 birds around the island. October 17–20 the old birds came and nest building began. The entire submergence of the island for a few days in October, owing to hurricanes and severe storms, drove most of the birds to another island east of the main one. By December 15 the new colony contained 5,000 nests with eggs or young. By April 1, when about half the young had left the reservation, a new flock of birds arrived and began nest building. Several hundred more came in about April 14, and by May 1 a second nesting was well under way. The season for visitors opened January 15, and the colony was inspected by about 35 parties.

Breton Island Reservation.—The appointment of an additional warden for the Breton Island Reservation took effect December 1, 1910. The birds noted during the year on this reservation included 12,000 or 13,000 ducks, mainly bluebills, 1,000 snipe, 2,000 other shore birds, 1,000 Forster's and least terns, and 4,000 laughing gulls.

Tortugas Reservation.—The existence of the colony of birds on the Tortugas Reservation was seriously threatened by rats. The rodents, which came from an old Norwegian schooner driven aground near the island in 1909, lived largely on crabs in winter, but later in the season destroyed hundred of birds' eggs and killed many young birds. Many of the rats were destroyed, and it is believed that the danger has been averted. The Department of Commerce and Labor instructed the lighthouse keepers at Loggerhead and Garden Keys to cooperate with the warden on Bird Key in preventing the gathering of terns' eggs, through which, in former years, the colony of least terns on Long Key was nearly exterminated.

Stump Lake.—Two dry seasons on Stump Lake Reservation have been bad for the ducks, though on July 1, 1910, young gulls were more numerous than ever before. On July 5 a hailstorm killed 95 per cent of the young birds on the reservation and 10 per cent of the adults.

Lake Malheur.—Various questions have arisen on Lake Malheur Reservation concerning the rights and privileges of residents on adjoining land—such questions as cutting hay between the meander line and the shore line, burning tules, grazing hogs on Pelican Island, destroying coyotes, and trapping fur-bearing animals. These questions have been so met as to maintain friendly relations with the residents and secure their cooperation.

Klamath Lake Reservation.—Under protection grebes are increasing on Klamath Lake. A trespasser who was shooting ducks from a motor boat was arrested in November by the warden and was fined $25 by the court. The warden has been commissioned deputy United States marshal for California and Oregon, and during the winter he cooperated with the warden service of California in protecting deer and antelope in the northern part of that State. In winter mule deer, driven by heavy snows out of the mountains of Oregon, repair to the Modoc lava beds, where they, as well as the antelope, are easily killed by lawless hunters. Both species are rapidly decreasing. Under the arrangement made it is hoped to prevent the illegal hunting.

Cold Springs Reservation.—The Cold Springs Reservoir, which was completed three years ago, was filled to its capacity this year for the first time. The boundaries of the reservation are 10.3 miles in length, and the water surface is 1,530 acres. Owing to the absence of rushes and green food and the roughness and depth of the water, present conditions are not favorable for nesting waterfowl, and it is not probable that the small number of breeding birds will be greatly increased in the near future. But from September to May this reservoir is a stopping place for thousands of migratory ducks and geese, the latter of which remain all winter. There was formerly considerable duck shooting here, but under the present protective regulations the shooting has ceased.

Deer Flat Reservation.—The Deer Flat Reservoir affords a resting place in the fall migration for large numbers of ducks and many geese, brant, and swans. Indications are that it will be also an important nesting ground for waterfowl in the future. The lake is, however, likely to become a pleasure resort, and as it is only a half hour's ride by trolley from Caldwell, and launches are being introduced, probably some restrictions will be needed.

Hawaiian Reservation.—Another Japanese vessel having been reported at Laysan Island, the revenue cutter *Thetis* was again dispatched to the island. The commander of the *Thetis* found, however, that the captain of the vessel, apparently ignorant of the arrest of the Japanese left the year before, had called for them, but had returned to Japan, and that no injury had been done to the birds of the island.

A cooperative arrangement was made with the University of Iowa to send an expedition to Laysan Island, through which conditions on the island might be investigated, temporary warden service established in the breeding season, and specimens of the fauna secured for the Biological Survey and the university. The specimens collected for the university will form the basis of a panoramic exhibit of the bird life of the island. The expedition visited Laysan late in April and remained until about the 1st of June. The bureau's representative notes in his preliminary report a marked decrease in the number

of albatrosses since his visit eight years before, due to the work of the Japanese poachers.

Salt River Reservation.—Forest rangers on the Tonto National Forest, Ariz., on which is located the Salt River Reservation, will report two or three times a year on the condition of the band of mountain sheep which ranges in the southern part of the Forest.

Keechelus Reservation.—The Forest Service will cooperate through its forest rangers in enforcing the laws upon the Keechelus Reservation and four others, which are located in National Forests in the interior of Washington.

NATIONAL BISON RANGE.

Two buffalo calves were born on the National Bison Range, in Montana, in September, 1910, and 19 in the spring of 1911. One male and two female buffalo from the Blue Mountain Forest Park, N. H., were presented by the American Bison Society and placed on the range. As no losses occurred during the year, these additions bring the present total of the herd up to 70. Twelve antelope were transferred from the Yellowstone National Park during the winter, four of which died. Seven elk were transferred from Jackson Hole, Wyo., in the early spring of 1911, all but one arriving in good condition.

ALASKA.

On July 29, 1910, new regulations were issued under the Alaskan game law, mainly to afford additional protection to deer and walrus. The hunting season for deer was shortened, a bag limit of eight was imposed, and the sale of venison was suspended during the year 1911. The walrus season, besides being shortened, was moved forward. Five wardens were employed during the year.

Provision was made by Congress for a larger warden service by means of an increase of $5,000 in the appropriation in the sundry civil bill for warden service in 1912. A special report by the governor on the operation of the game law was published by the Biological Survey as Circular No. 77. Twenty-three permits were issued for collection and export of specimens. The specimens entered comprised one moose, three brown bears, and several packages of birds, eggs, and nests, secured for various museums in the United States and one at Bucharest, Roumania. Under authorization by the governor the following trophies were exported from the Territory: Eleven caribou, 29 moose, 45 mountain sheep, and 31 brown bears.

ELK IN WYOMING.

The appropriation made by Congress for caring for the starving elk in the Jackson Hole region, Wyoming, being immediately available on March 4, Mr. Edward A. Preble, of the Biological Survey, was at once sent to Wyoming to make a thorough examination of the situation. Mr. D. C. Nowlin, recently State game warden, was appointed his assistant. It was found that the State had already purchased all the available hay in Jackson Hole and was feeding as many of the animals as possible. Attention was thereupon turned to other phases of the problem. The conditions causing the lack of food and

the number of elk that perished were investigated; the possibility of securing hay next year was given special attention; the region was searched for sites available for winter refuges for the elk, and the possibility of transferring a number of elk to other localities was considered. Two small herds were transferred to the National Bison Range in Montana and the Wichita Game Refuge in Oklahoma. Careful attention was given to the feasibility of transferring elk to the Medicine Bow Mountains and the Big Horn Range next winter. In short, the Survey has undertaken a thorough study of the elk problem in all its phases, and a preliminary report will soon be published.

INFORMATION CONCERNING GAME.

Advantage was taken of the presence in northern Michigan of a representative of this bureau to secure information of the comparative abundance of deer now and during the past five years, the relative number of hunters in the woods during the hunting season, methods of hunting, character of the warden service employed, the number of deer shipped, the weight of deer, and the comparative condition of the fur market. In June, 1911, Mr. D. C. Nowlin was employed to obtain definite information concerning the antelope in Idaho and Oregon and to find localities in eastern Oregon suitable for elk. On June 1 Mr. A. C. Cooper visited Texas to report upon the location, size, and condition of the bands of antelope in that State and the present efforts to preserve them. The bureau has secured for the first time statistics of the deer killed in Missouri, Montana, and Wyoming during the hunting season and has made important progress in ascertaining the distribution of big game in the National Forests.

The index of game legislation has made notable progress. The indexing of the laws of Vermont, New Jersey, Delaware, South Carolina, Mississippi, Texas, Tennessee, Kentucky, Indiana, and Ohio was completed during the year, and the bureau now has a full index of game legislation of all the States except five of the New England States, New York, Pennsylvania, Maryland, and North Carolina.

Data were collected, as usual, concerning the number and details of fatal hunting accidents.

The customary annual game publications were issued, including the directory of game officials and organizations, the compilation of the game laws in force in 1910, and the summary of progress in game protection in 1910.

COOPERATIVE WORK IN GAME PROTECTION.

One of the most important features of the work of the Section of Game Preservation consists of cooperation with State game officials and private organizations in the protection of game. During the past fiscal year the bureau has cooperated with New York, Virginia, and Missouri in checking illegalities under the game laws; with Louisiana, Delaware, Pennsylvania, Ohio, and Indiana in furnishing information needed; with New Jersey and Wisconsin in conducting civil-service examinations for candidates for deputy wardenships; with New Jersey, also, in introducing quail and deer into its game covers; with Wyoming in solving the problem presented by the con-

gestion of elk each winter in the Jackson Hole region; with the Boone and Crockett Club in securing antelope for the Wichita Game Preserve and the National Bison Range; with the Benevolent Protective Order of Elks in securing elk for the Wichita Game Preserve; with the American Bison Society in locating a suitable site in South Dakota for a new bison range, and with the National Association of Audubon Societies in maintenance of some of the bird reservations.

PLUMAGE.

The Biological Survey has cooperated actively with officials of various States in enforcing the laws prohibiting the sale and possession of certain plumage for millinery. The condition of the plumage traffic of Los Angeles, San Francisco, Salt Lake City, Denver, Kansas City, St. Louis, Chicago, and Milwaukee was investigated. It was found that no heron aigrettes were being sold in California, and very few in Utah and Colorado; a few were on sale in St. Louis and Kansas City, which were shortly afterwards seized under the game law; a few in Milwaukee, and many in Chicago. The Shea law, passed by the New York Legislature in 1910, went into operation July 1, 1911, and a similar law passed by the New Jersey Legislature in May, 1911, became effective in August, 1911. Each of these laws prohibits the sale or possession of plumage of birds of the same family as any that are found within the State. The desirability of similar legislation will be brought to public attention in other parts of the United States. Through the State Department statistics of the trade in aigrettes throughout the world have been secured, and the bureau will soon publish this information.

The newly appointed plumage expert of Missouri was given the opportunity to study our collection of birds and to consult our ornithological works. Not only has he thus been enabled to do better official work, but he incidentally brought out certain facts of general interest to ornithologists as well as bird protectors.

INTERSTATE COMMERCE IN GAME.

As heretofore the policy pursued in the enforcement of sections 242, 243, and 244 of the Criminal Code of the United States regulating interstate commerce in game has aimed at prevention of violations rather than prosecution.

At the beginning of the sale season for game the most important game markets of the United States—Philadelphia, Buffalo, Cleveland, Indianapolis, St. Louis, and Chicago—were personally inspected by a representative of the bureau and showed fairly general compliance with the law and a notable falling off in the amount of game handled. Investigation of Mississippi County, Ark., an important point of supply, afforded useful knowledge relative to conditions and methods at that point. Evidence of a large number of shipments from Arkansas to St. Louis furnished this bureau by the chief deputy game and fish commissioner of Missouri was carefully reexamined, but failed to disclose any case of sufficient strength to justify prosecution.

It was ascertained that on the coast of Virginia, an important source of supply for the eastern markets, ducks were being netted and

shipped without regard to the State and Federal law. The ten chief offenders were indicted in the United States district court for the eastern district of Virginia. Two were convicted and fined $200 and costs each and the other cases went over to the November term of court.

A number of violations of the interstate law were referred to the State authorities, and in practically all of them convictions were secured and fines imposed ranging from $25 to $50. On information from the New York game officials relative to certain imported foreign game in cold storage in New York City, to be shipped later to Chicago, this bureau informed the Illinois authorities in order that they might take the necessary measures to enforce their laws. Through information given to the authorities of New York concerning certain shipments from other States, an important case of violation of the New York law requiring bonds for stored game was disclosed, and conviction of the offenders with a substantial penalty followed.

OUTLINE OF WORK FOR 1912.

ECONOMIC ORNITHOLOGY AND MAMMALOGY.

Work on the food habits of birds and mammals will be continued, including field observations and the examination of stomachs and tabulation of their contents.

Cooperation with the Forest Service will be continued to devise practical methods of protecting tree seeds and seedlings from the attacks of birds and mammals during the reforesting of treeless areas within our National Forests; also in destroying prairie dogs within the National Forests and contiguous areas. Field observations and experiments will be made to devise methods to prevent attacks on orchard and nursery stock by field mice, pine mice, rabbits, and other injurious rodents.

Cooperation will be continued with the Reclamation Service in protecting dikes and fills from the depredations of burrowing animals.

Investigations will be continued to devise methods for preventing the attacks of crawfish on cotton and grain crops in the Southern States.

Field observations will be carried on in Utah and contiguous States to determine the value of birds in checking the spread of the newly imported alfalfa weevil. Investigations into the food of wild ducks and geese will be continued, and a report will be published as soon as possible. Investigations of the food habits of the flycatchers and meadowlarks will be completed and reports published. Study of the food of thrushes and crows will be continued.

Experiments with traps and poisons for the destruction of English sparrows will be carried on.

GEOGRAPHIC DISTRIBUTION.

During the coming year work will be continued on the biological surveys of the lower Mississippi Valley States and of Alabama, also of Montana and Idaho. It is expected that the field work of a biological survey of Wyoming will be completed. It is hoped to complete the field work in California so as to permit the publication of a

report, with map, on the life zones of the State. The biological survey of the Canal Zone in cooperation with the Smithsonian Institution will be continued.

A report on a biological reconnoissance through northern British Columbia will be prepared for publication. A report upon the birds of Texas, now nearing completion, will be published; also a bulletin on the distribution and migration of the herons and ibises.

The preparation of maps showing the distribution of the species of North American mammals and birds, as well as the collection and card cataloguing of information concerning their distribution and habits, will be pushed as rapidly as possible.

GAME PROTECTION.

In addition to carrying on the various projects now under way, attention will be given to a number of new matters. It may be necessary to establish inspection of importations in Porto Rico on account of a law adopted in that Territory early in 1911. It may also be necessary to place restrictions on the importations into the United States of monkeys, to guard against the danger of the introduction of the disease trypanosomiasis.

Operations connected with the enforcement of the Federal law regulating interstate commerce in game will be continued and extended. Many waterfowl are illegally shipped from North Carolina to northern markets, and the practice will be investigated and steps taken to stop it. The passage of the Bayne bill in New York, by closing the markets of New York to native game, will greatly facilitate this work. The shipping of deer and grouse to the Chicago market from Michigan and Wisconsin, in violation of the laws of these States, will be investigated.

Several bird reservations now without warden service or supplied only temporarily will be provided with regular wardens, including probably the reservations in Idaho, Oregon, and Washington, also the Belle Fourche Reservation in South Dakota, and possibly some of the Florida reservations. It is planned also to appoint inspectors for several districts. Efforts will be made to establish a warden service on Laysan Island during next spring and summer and to have the *Thetis* visit the island again next winter. Steps will be taken also to exterminate or at least reduce the numbers of rabbits that now are a pest on the island.

Attempts (unsuccessful last year) will be renewed to secure mountain sheep for the National Bison Range in Montana. In cooperation with the American Bison Society efforts to secure a suitable site in South Dakota for a new bison range will be continued. The preliminary steps have been taken, and early in the new fiscal year an agent will examine the various localities that have been suggested.

The problem of the preservation and restoration of the big game of the country is receiving careful consideration, and several measures will be undertaken during the coming year along that line. Efforts will be made to provide elk for one or two National Forests in Colorado, for the Medicine Bow Mountains in Wyoming, and for various points in eastern Oregon, provided they prove suitable for elk. Through one of the principal associations of sportsmen it is

hoped to introduce elk at one or two points in Arizona, and through the Order of Elks or otherwise an effort will be made to increase the herd of elk in the Wichita Game Preserve. These measures are part of a plan to restock the Rocky Mountain States with elk. The preservation of the antelope is one of the most difficult problems presented. A careful survey of the condition of antelope will be made in two States in the Northwest, Idaho and Oregon, and three in the Southwest, Texas, Colorado, and Kansas, in order to ascertain what can be done to preserve from extinction this valuable and attractive species, the only antelope of the Western Hemisphere. The transfer of big game from points of comparative abundance to suitable localities where it is wanting will be made a special feature of the work of the coming year.

○